

IDC Re-Engineering Phase 2

Data Model to CSS Mappings v1.0

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Data Model to CSS Mappings

Version 1.0

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ABSTRACT

This initial draft document contains formative data model content for select areas of Re-Engineering Phase 2 IDC System. The purpose of this document is to facilitate discussion among the stakeholders. It is not intended as a definitive proposal.

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REVISIONS

Version	Date	Author/Team	Revision Description	Authorized by
V1.0	12/2015	IDC Re-engineering Team	Initial delivery	M. Harris

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1.1. Notation:

- A schema table column that is ~~striked out~~ and **highlighted red** means we no longer need that column and it can be safely removed.
- A schema table column that is underlined and **highlighted green** means we needed a new column that maps to an attribute or association in our Data Model
- A schema table name that is underlined and **highlighted green** means we needed an entirely new table to accommodate our Data Model
- A Data Model Class and Attribute with a cell value of “-“ means it is not used in the Data Model. These tend to be primary keys in each table.
- A Data Model Class and Attribute that is **highlighted grey** means there was no equivalent value in the Data Model. These tend to coincide with removed schema table columns, but do not necessitate that a column has to be removed.

2. STATION MAPPINGS

2.1. Station Table (station)

IDC Database Schema	Data Model	
station Table Column	Class	Attribute
staid	-	-
sta	Station	name
statype	Station	station type
ontime	Station	on time
offtime	Station	off time
lat	Station	lat
lon	Station	lon
elev	Station	elevation

Key Type	Columns
Primary	staid

2.2. Alias Table (station_alias)

IDC Database Schema	Data Model	
station_alias Table Column	Class	Attribute
staid	Alias	parent station
aliasid	-	-
alias	Alias	name
ontime	Alias	on time
offtime	Alias	off time

Key Type	Columns
Primary	aliasid
Foreign (to station.staid)	staid

2.3. Network Table (network)

IDC Database Schema	Data Model	
network Table Column	Class	Attribute
<u>netid</u>	-	-
net	Network	name
<u>netname</u>		
<u>nettype</u>		
auth		
<u>commid</u>		
<u>lddate</u>		
<u>ontime</u>	Network	on time
<u>offtime</u>	Network	off date

Key Type	Columns
Primary	netid

2.4. Affiliation Table (affiliation)

IDC Database Schema	Data Model	
affiliation Table Column	Class	Attribute
netid	Affiliation	network (reference)
staid	Affiliation	station (reference)
<u>lddate</u>		
<u>author</u>	Affiliation	author
<u>ontime</u>	Affiliation	ontime
<u>offtime</u>	Affiliation	offtime

Key Type	Columns
Primary	(netid, staid, ontime)
Foreign (to station.staid)	staid
Foreign (to network.netid)	netid

2.5. Site Table (site)

IDC Database Schema		Data Model	
site Table Column		Class	Attribute
sta			
siteid		-	-
sitename		Site	name
ondate		Site	on date
offdate		Site	off date
lat		Site	lat
lon		Site	lon
elev		Site	elevation
staname			
statype			
refsta			
dnorth			
deast			
lddate			

Key Type	Columns
Primary	siteid

2.6. Station Membership Table (station_membership)

IDC Database Schema		Data Model	
station_membership Table Column		Class	Attribute
staid		Station Membership	station (reference)
siteid		Station Membership	site (reference)
author		Station Membership	author
ontime		Station Membership	on time
offtime		Station Membership	off time

Key Type	Columns
Primary	(staid, siteid, ontime)
Foreign (to station.staid)	staid
Foreign (to site.siteid)	siteid

2.7. Channel Table (channel)

IDC Database Schema	Data Model	
channel Table Column	Class	Attribute
chanid	-	-
chan	Channel	name
lat	Channel	lat
lon	Channel	lon
elev	Channel	elevation
vang	Channel	vertical angle
hang	Channel	horizontal angle

Key Type	Columns
Primary	chanid

2.8. Raw Channel Table (sitechan)

IDC Database Schema	Data Model	
sitechan Table Column	Class	Attribute
sta	-	-
rawchanid	-	-
chanid	Raw Channel	channel (reference)
siteid	Raw Channel	site (reference)
loccode	Raw Channel	location code
ondate	Raw Channel	on date
chanid	-	-
offdate	Raw Channel	off date
ctype	Raw Channel	channel type
edepth	Raw Channel	depth
hang	-	-
vang	-	-
descript	-	-
lddate	-	-

Key Type	Columns
Primary	rawchanid
Foreign (to channel.chanid)	chanid
Foreign (to site.siteid)	siteid

2.9. Derived Channel Table (`derived_channel`)

IDC Database Schema		Data Model	
derived_channel Table Column		Class	Attribute
	chanid	Derived Channel	channel (reference)
	operid	Derived Channel	sigpro operation (reference)

Key Type	Columns
Primary	(chanid, operid)
Foreign (to channel.chanid)	chanid
Foreign (to sigproop.operid)	operid

2.10. Instrument Table (`instrument`)

IDC Database Schema		Data Model	
instrument Table Column		Class	Attribute
<code>rawchanid</code>		Instrument	raw channel (reference)
<code>manufacturer</code>		Instrument	manufacturer
<code>model</code>		Instrument	model
<code>snumber</code>		Instrument	snumber
<code>ontime</code>		Instrument	on time
<code>offtime</code>		Instrument	off time
<code>inid</code>		-	-
<code>insname</code>			
<code>instype</code>			
<code>band</code>			
<code>digital</code>			
<code>samprate</code>			
<code>ncalib</code>		Instrument	nominal cal ratio
<code>ncalper</code>		Instrument	nominal cal per
<code>tshift</code>		Instrument	nominal tshift
<code>nresponse</code>		Instrument	nominal response
<code>dir</code>			
<code>dfile</code>			
<code>rsptype</code>			
<code>lddate</code>			

Key Type	Columns
Primary	inid
Foreign (to sitechan.rawchanid)	rawchanid

2.11. Calibration Table (sensor)

IDC Database Schema	Data Model	
sensor Table Column	Class	Attribute
<u>sta</u>		
<u>calibid</u>	-	-
<u>rawchanid</u>	Calibration	raw channel (reference)
time	Calibration	calibration time
<u>duration</u>	Calibration	calibration duration
<u>endtime</u>		
<u>inid</u>		
<u>chanid</u>		
<u>jdate</u>		
calratio	Calibration	cal ratio
calper	Calibration	cal per
tshift	Calibration	tshift
<u>instant</u>		
lenddate	-	-

Key Type	Columns
Primary	calibid
Foreign (to sitechan.rawchanid)	rawchanid

3. SIGNAL DETECTION MAPPINGS

3.1. Signal Detection Hypothesis Feature Measurement Table (sdhfm) (was amplitude table)

Column	Class	Attribute
sdhfmid (was ampid)	-	-
arid		
parid		
chan		
val (was amp)	Signal Detection Hypothesis Feature Measurement	measurement value
per		
snr		
amptime		
start_time	Signal Detection Hypothesis Feature Measurement	calculation window
duration	Signal Detection Hypothesis Feature Measurement	calculation window
bandw		
featuretype (was amptype)	Signal Detection Hypothesis Feature Measurement	feature type
units	Signal Detection Hypothesis Feature Measurement	units
clip		
inarrival		
auth	Signal Detection Hypothesis Feature Measurement	author
lddate		
uncertainty	Signal Detection Hypothesis Feature Measurement	uncertainty
algorithm	Signal Detection Hypothesis Feature Measurement	algorithm
sdhparent	Signal Detection Hypothesis Feature Measurement	Signal Detection Hypothesis parent

Key Type	Columns
Primary	sdhfmid
Foreign (to arrival.arid)	sdhparent

3.2. Signal Detection Hypothesis Table (arrival)

Column	Class	Attribute
sta		
time		
arid	-	-
jdate		
stassid		
chanid		
chan		
iphase	Signal Detection Hypothesis	phase
stype		
deltim		
azimuth		
delaz		
slow		
delslo		
ema		
rect		
amp		
per		
logat		
clip		
fm		
snr		
qual		
auth	Signal Detection Hypothesis	author
commid		
lddate		
procStage	Signal Detection Hypothesis	processing stage
rejected	Signal Detection Hypothesis	rejected
parentsd	Signal Detection Hypothesis	Signal Detection parent

Key Type	Columns
Primary	arid
Foreign (to sigdet.sdid)	parentsd

3.3.

3.4. Signal Detection Table (sigdet)

Column	Class	Attribute
sdid	-	-
monitoring organization	Signal Detection	monitoring organization

Key Type	Columns
Primary	sdid

3.5. Association Table (assoc)

Column	Class	Attribute
arid	-	-
orid	-	-
sta		
phase		
belief		
delta		
seaz		
esaz		
timeres		
timedef		
azres		
azdef		
slores		
slodef		
emares		
wgt		
vmodel		
commid		
lddate		
rejected	Association	rejected
author	Association	author
algorithm	Association	algorithm

Key Type	Columns
Primary, Foreign (to arrival.arid)	arid
Primary, Foreign (to origin.orid)	orid

4. EVENT CLASS MAPPINGS

4.1. Event Table (event)

Column	Class	Attribute
evid	-	-
evname	-	-
preforid	Event	preferred event hypothesis
auth	Event	monitoring organization
commid		
lddate		

Key Type	Columns
Primary	evid
Foreign (to origin.orid)	preforid

4.2. Event Hypothesis Table (origin)

Column	Class	Attribute
lat		
lon		
depth		
time		
orid	-	-
evid	Event Hypothesis	parent event
jdate		
nass		
ndef		
ndp		
grn		
srn		
etype	Event Hypothesis	source type
depdp		
dtype		
mb		
mbid		
ms		
msid		
ml		
mlid		
algorithm	Event Hypothesis	algorithm
auth	Event Hypothesis	author
commid		
lddate		
procstage	Event Hypothesis	processing stage
stagepref	Event Hypothesis	preferred for stage
rejected	Event Hypothesis	rejected
preflocid	Event Hypothesis	preferred location solution
parentorid	Event Hypothesis	parent event hypothesis

Key Type	Columns
Primary	orid
Foreign (to event.evid)	evid
Foreign (to locsol.locid)	preflocid
Foreign (to origin.orid)	parentorid

4.3. Association Table (assoc)

Column	Class	Attribute
arid	Association	signal detection hypothesis
orid	Association	event hypothesis
sta		
phase		
belief		
delta		
seaz		
esaz		
timeres		
timedef		
azres		
azdef		
slores		
slodef		
emares		
wgt		
vmodel		
commid		
lddate		
<u>rejected</u>	Association	rejected
<u>author</u>	Association	author
algorithm	Association	algorithm

Key Type	Columns
Primary	(arid, orid)
Foreign (to arrival.arid)	arid
Foreign (to origin.orid)	orid

4.4. Location Solution Table (locsol)

Column	Class	Attribute
locid	-	-
orid	-	-
lat	Location Solution	lat
lon	Location Solution	lon
depth	Location Solution	depth
time	Location Solution	time
latrestraint	Location Solution	restraints
lonrestraint	Location Solution	restraints
depthrestraint	Location Solution	restraints
timerestrain	Location Solution	restraints
manualsolution	Location Solution	manual solution
author	Location Solution	author
algorithm	Location Solution	algorithm

Key Type	Columns
Primary	locid
Foreign (to origin.orid)	orid

4.5. Location Solution Defining Table (lsdef)

Column	Class	Attribute
locid	-	-
msmtid	Location Defining Behavior	signal detection hypothesis feature measurement
defining	Location Defining Behavior	defining

Key Type	Columns
Primary	(locid, msmtid)
Foreign (to locationsolution.locid)	locid
Foreign (to sdhfm. sdhfmid)	msmtid

4.6. Location Uncertainty (origerr)

Column	Class	Attribute
<u>erid</u>		
<u>origerrid</u>	-	-
sxx, syy, szz, stt, sxy, sxz, syx, stx, sty, stz	Location Uncertainty	4D covariance matrix
<u>sdepth</u>		
<u>smajax</u>		
<u>sminax</u>		
<u>strike</u>		
<u>stime</u>		
<u>conf</u>		
<u>commid</u>		
<u>lddate</u>		
<u>locid</u>	-	-

Key Type	Columns
Primary	origerrid
Foreign (to locsol.locid)	locid

4.7. Ellipse Table (ellipse)

Column	Class	Attribute
ellipseid	-	-
origerrid	Ellipse	parent Location Uncertainty
smajax	Ellipse	semi major axis
sminax	Ellipse	semi minor axis
strike	Ellipse	major axis azimuth
sdepth	Ellipse	depth uncertainty
stime	Ellipse	time uncertainty
conf	Ellipse	confidence level
type	Ellipse	scaling factor type

Key Type	Columns
Primary	ellipsoid
Foreign (to origerr.origerrid)	origerrid

4.8. Ellipsoid Table (ellipsoid)

Column	Class	Attribute
ellipsoidid	-	-
origerrid	-	parent Location Uncertainty
smajax	Ellipsoid	semi major axis
sminax	Ellipsoid	semi minor axis
syntax	Ellipsoid	semi intermediate axis
az	Ellipsoid	major axis azimuth
plunge	Ellipsoid	major axis plunge
rotation	Ellipsoid	major axis rotation
stime	Ellipsoid	time uncertainty
conf	Ellipsoid	confidence level
type	Ellipsoid	scaling factor type

Key Type	Columns
Primary	ellipsoidid
Foreign (to origerr.origerrid)	origerrid

4.9. Prediction Information Table (locsolpred)

Column	Class	Attribute
predid	-	-
prediction	Prediction Information	predicted value
uncertainty	Prediction Information	uncertainty
weight	Prediction Information	weight
predictor	Prediction Information	predictor
msmtid	Prediction Information	signal detection hypotheses feature measurement
locid	-	-

Key Type	Columns
Primary	predid
Foreign (to sdhfm.sdhfmid)	msmtid
Foreign (to locsol.locid)	locid

5. MAGNITUDE MAPPINGS

5.1. Station Magnitude Solution Table (stamag)

Column	Class	Attribute
magid	-	-
sta		
arid		
erid		
evid		
phase		
magtype	Magnitude Solution	mag type
magnitude	Magnitude Solution	mag
uncertainty	Magnitude Solution	uncertainty
auth	Magnitude Solution	author
commid		
lddate		
lsid	Magnitude Solution	parent location solution

Key Type	Columns
Primary	magid
Foreign (to ls.lsid)	lsid

5.2. Network Magnitude Solution Table (netmag)

Column	Class	Attribute
magid	-	-
net		
ord		
evid		
magtype	Magnitude Solution	mag type
nsta		
magnitude	Magnitude Solution	mag
uncertainty	Magnitude Solution	uncertainty
auth	Magnitude Solution	author
commid		
lddate		
lsid	Magnitude Solution	parent location solution

Key Type	Columns
Primary	magid
Foreign (to ls.lsid)	lsid

5.3. Station Magnitude SDHFM Defining Table (stamagdef)

Column	Class	Attribute
magid	-	-
measid	Station Magnitude Solution	SDHFM reference

Key Type	Columns
Primary	magid, measid
Foreign (to stamag.magid)	magid
Foreign (to sdhfm.measid)	measid

5.4. Magnitude Defining Behavior Table (netmagdef)

Column	Class	Attribute
netmagid	Magnitude Defining Behavior	Network Magnitude Solution parent
stamagid	Magnitude Defining Behavior	Station Magnitude Solution reference
defining	Magnitude Defining Behavior	defining
author	Magnitude Defining Behavior	author

Key Type	Columns
Primary	netmagid, stamagid
Foreign (to netmag.magid)	netmagid
Foreign (to stamag.magid)	stamagid

6. OPEN ISSUES

1. Do we need the “clip” attribute in SDHFM (formerly amp) table? If so, we should add to the Data Model
2. The SDHFM stores “calculation window” as the start time and the duration length columns. Is this appropriate?
3. How do we link SDHFM to a Waveform? Does this necessitate a change in the Data Model to reference Channel instead?
4. Should we combine stamag and netmag to form just one mag table?
5. Should we combine location defining and mag defining into one “feature measurement defining” table?

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